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NAS WHITING FIELD
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LETTER REGARDING U S EPA REGION IV REVIEW AND COMMENTS ON REMEDIAL INVESTIGATION FOR SITE 16 NAS WHITING FIELD
5/24/1999
U S EPA REGION IV

May 24, 1999

4WD-FFB

Ms. Linda Martin
Southern Division
Naval Facilities Engineering Command
P.O. Box 190010
2155 Eagle Drive
North Charleston, South Carolina 29419-9010

SUBJ: RI Report for Site 16

Dear Ms. Martin:

The United States Environmental Protection Agency (EPA) has received and reviewed the Remedial Investigation (RI) Report for Site 16, Open Disposal and Burning Area, at NAS Whiting Field, dated January 1999. In general, the RI Report presents sufficient data to support the recommendation for a focused feasibility study. Enclosed are EPA's comments based on this review.

If you should have any questions or comments, please contact me at (404) 562-8555.

Sincerely,

Craig A. Benedikt
Remedial Project Manager
Federal Facilities Branch

Enclosure

cc: Jim Cason, FDEP

EPA Review Comments Report for
Remedial Investigation Report for Site 16
Open Disposal and Burning Area
January 1999

SPECIFIC COMMENTS:

1. **Page iv, Second Bulleted Item**. Please note that the memo accompanying the EPA Region III Risk-Based Concentration (RBC) table from Roy L. Smith, toxicologist, clearly states that generally the RBC table should not be used to set cleanup levels. As such, the RBCs should not be referred to as residential soil cleanup goals.

2. **Page xvi, Glossary**. The definition for **IRIS** in the glossary is unreadable. Please revise in subsequent versions of the report.

3. **Page 3-6, Table 3-1 and Appendix C**. Table 3-1 presents a Summary of Monitoring Well Construction Details and Appendix C contains individual monitoring well and test pit logs. However, many of the well logs listed in Table 3-1 are not presented in Appendix C. Also, monitoring well logs WHF-16-2D and WHF-16-6I are presented in Appendix C, but are not listed in Table 3-1. Additionally, several monitoring well logs (WHF-15-3I, 15-3D, 15-4S, 15-5S, WHF-16-3II) in Appendix C are missing pages and monitoring well logs WHF-15-15-4S, WHF-15-5S and WHF-1466-6S appear to be mislabeled. These discrepancies should be corrected in the RI Report.

4. **Page 5-6, Section 5.2, Hydraulic Conductivity and Seepage Velocity**. The text states, "The average hydraulic conductivity values for individual monitoring wells at Site 16 ranged from 0.27 feet per day (ft/day) (9.5×10^{-2} centimeters per second [cm/sec]) for WHF-16-3D to 46.5 ft/day (1.64×10^{-5} cm/sec) for WHF-16-3II. The geometric mean of the hydraulic conductivity values for Site 16 is 22.2 ft/day (7.8×10^{-4} cm/sec) or approximately 8,000 feet per year." However, the centimeters per second values appear to have been incorrectly converted from the values in feet per day. The values 0.27 ft/day should be 9.5×10^{-5} cm/sec, 46.5 ft/day should be 1.64×10^{-2} cm/sec and 22.2 ft/day should be 7.8×10^{-3} cm/sec. The calculations should be verified and corrected in the text if necessary.

5. **Page 5-11, Table 5-2**. As indicated on Table 5-2, the distance between monitoring wells WHF-16-2S and WHF-16-4S and between wells WHF-16-6S and WHF-16-3S are 900 feet and 495 feet, respectively. However, according to the scale presented on Figures 5-5 and 5-6, the distances are 930 and 540 feet, respectively. This amount of difference in the distances between wells would change the hydraulic gradient calculations, therefore the correct well distances should be used in calculating the hydraulic gradients and should be

corrected in the text as well as the table.

6. **Page 5-15, Section 5.3**. The text states that a mounded feature was associated with a *significant* total magnetic anomaly and a conductivity anomaly. However the text does not elaborate further as to the nature of the anomalies. Has the potential existence of buried drums been investigated? The text also states, "An attempt was made to determine the depth of the fill at Site 16 using DC resistivity. Results were inconclusive, however, and the survey was not completed (ABB-ES, 1993)." The text should provide additional information stating why the results were inconclusive and why the survey was not completed.

7. **Page 5-23, Figure 5-9**. Figure 5-9 presents interpreted total volatile organic compounds (VOC) isopleth lines. Soil gas sample location numbers 35 and 45 are, according Figure 5-9, near the total VOC concentration line which indicates greater than 5000 parts per million (ppm). If soil gas sample locations 35 and 45 have concentrations greater than 5000 ppm, the actual concentrations at these locations should be stated in the text of the RI Report.

8. **Page 5-40, Section 5.5**. When comparing site related data to the EPA Region III RBCs, the text should clearly state whether industrial or residential values were exceeded. This comment also applies to other locations within the report where data is screened against the RBCs.

9. **Page 5-43, Table 5-12**. The semi-volatile constituent presented in Table 5-12 as methylnaphthalene should be corrected to be 2-methylnaphthalene.

10. **Page 5-49, Section 5.7**. The text should clearly state the intent behind comparing site related data for surface water to the Florida Groundwater Guidance Concentrations.

11. **Page 5-60, Section 5.8.2**. In the last paragraph on this page, the text should state that aluminum exceeded the Federal and State **secondary** MCL in two monitoring wells. The comment applies elsewhere in the report where aluminum exceedances in groundwater are being reported.

12. **Page 5-72, Table 5-24**. Several of the Federal Maximum Contaminant Levels (MCLs) and Florida Guidance concentrations for the associated constituents appear to be incorrect. For example, the Federal MCL and Florida groundwater guidance for 1,2-dichloroethene (total) should both be 70 micrograms per liter (µg/l). However, Table 5-24 lists these concentrations as 55 µg/l and 7 µg/l respectively. These guidance numbers should be checked and verified prior to performing the feasibility study.

13. **Page 5-76, Section 5.8.2**. According to the EPA Region 4, Environmental Investigations Standard Operating Procedures and Quality Assurance Manual, May 1996, as a standard practice, ground water samples will not be filtered for routine analysis. Filtering will usually only be performed to determine the fraction of major ions and trace metals passing the filter and used for flow system analysis and for the purpose of geochemical

speciation modeling. Filtration is not allowed to correct for improperly designed or constructed monitoring wells, inappropriate sampling methods, or poor sampling technique. When samples are collected for routine analyses and are filtered, such as under conditions of excessive turbidity, both filtered and non-filtered samples will be submitted for analyses. With this in mind, this section of the report should address the findings of the non-filtered sample analysis followed by a discussion of the filtered samples. The text should also address discrepancies between non-filtered versus filtered samples.

14. **Page 5-78, Section 5.8.2**. Please verify the federal MCL for 1,2-dichloroethene as reported in the third paragraph.

15. **Appendix C, Monitoring Well and Test Pit Logs**. The boring log for monitoring well WHF-15-71 lists "OVA" under the column for drilling method. OVA is incorrect, the correct drilling method should be either mud rotary, hollow stem auger or other drilling method as appropriate. The boring log should be corrected to reflect the proper drilling method. Also, several well logs have the well development date omitted. This information should be added to the well logs that do not have this information. The test pit lithologic description logs do not have the name of the individual who logged the excavation. This information should be included on the test pit logs.

16. **Appendix E, Surface Water Analytical Data**. A duplicate set of groundwater analytical data, presented as Appendix G was included in Appendix E, Surface Water Analytical Data. This duplicate data set should be removed from the RI.

** The following comments relate to the human health and ecological risk review sections of the Site 16 RI Report:

GENERAL COMMENTS:

17. Section 6.4 of the report presents the human health toxicity assessment for Site 16. The text states that Appendix G contains brief toxicity summaries for human health contaminants of potential concern (COPCs) identified in surface soil, subsurface soil, surface water, and groundwater at the site. However, Appendix G does not presently contain this information. In addition, toxicity profiles are not included in the ecological risk assessment (ERA) for compounds that are present at concentrations greater than their ecological screening value. This information should be included as part of the ecological toxicity evaluation. In order to evaluate the toxic potential of the contaminants identified in the media at this site, toxicological information should be presented for each of the contaminants identified as human health and ecological chemicals of concern.

18. The step-wise procedure that is used to identify Contaminants of Concern (COCs) at Site 16 (illustrated in Figure 7-3, Page 7-10) does not follow the step-wise procedure delineated in *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessment* ("Process Document", 1997). EPA Region IV has stated that

all ERAs that have not been finalized must follow the procedures described in the Process Document, which supersedes all prior guidance. The most significant difference between the procedures used in this ERA and the Process Document is that in this ERA, compounds are compared to frequency, background levels, and role as essential nutrients before being compared to ecological screening levels. The initial step identified by the Process Document is the comparison of compound concentrations to ecological screening levels, so that the potential for risk is determined before mitigating factors are considered. Refer to the Process Document and the December 1998 Region IV memorandum for additional guidance on revising the ERA.

19. The method that is used to quantify risk in this ERA is not in accordance with current EPA and Region IV guidance. Food chain modeling based solely on soil concentrations, which is the approach used in this ERA, is strongly discouraged in the new guidance. Instead, the actual exposure of primary consumers (such as the mouse, shrew, and meadowlark) to compounds that are present in environmental media at concentrations greater than their ecological screening and background values is to be determined by sampling and analysis of earthworms/insects and plants at the site. This approach reduces much of the uncertainty associated with former procedures, including the issues of bioavailability and soil-to-organism transfer rates. Since it appears that all of the samples from this site were collected prior to the release of the new guidance (1996 and earlier), the lack of biological samples to support the ERA is understood. However, it is strongly recommended that the procedures for conducting ERAs at other Whiting Field sites be revised so that they are in closer agreement with the Process Document and the most recent Region IV guidance.

20. The Dutch soil screening levels that are used as ecological screening values for Site 16 [Beyer. 1990. Evaluating soil contamination. US Fish and Wildlife Service, Biological Report 90(2)] may not be sufficiently protective of ecological receptors. Region IV issued ecological screening levels for soil in December 1998 and has stated that screening levels used in ERAs that have not been finalized should be comparable to the values that have been adopted. When the two sets of screening values were compared, it was determined that the screening values used for arsenic and chromium in this ERA are much higher than those adopted by Region IV. The recommended screening value for arsenic is 10 mg/kg rather than 20 mg/kg and for chromium is 0.4 mg/kg rather than 100 mg/kg. If the Region IV values had been used in this ERA, neither compound would have been screened out and the risks both compounds would have been calculated. Potential risks from arsenic and chromium must be addressed in the ERA.

21. An assessment of risks from subsurface soil (below a depth of 1 foot) to ecological receptors is not included in the ERA. Although it is unlikely that birds and mammals will have consequential contact with subsurface soil, the root zone of many shrubs and trees such as pine trees will include subsurface soil. Also, soil invertebrates such as earthworms and fire ants can be expected to burrow into deeper than 1 foot into the subsurface soil. A qualitative assessment of risks in subsurface soil to these receptor groups should be included in the ERA.

22. Hazard Quotients (HQs) for contaminants at Site 16 are calculated using the 95% Upper

Confidence Limit (UCL) rather than the maximum site concentration. Region IV has stated that 95% UCLs should not be used in ERA. Rather, to show the potential risk at the site, HQs should be determined using the following combinations: maximum site concentration/NOAEL, average site concentration/NOAEL, maximum site concentration/LOAEL, and average site concentration/LOAEL. For Site 16, the perceived maximum risks are, in general, increased less than four-fold if the maximum concentration is used rather than the 95% UCL. The Hazard Indices for most receptors remain less than 1. No changes are requested in the Site 16 ERA regarding to the use of the 95% UCL, but future submissions should not use the 95% UCL to calculate risk.

SPECIFIC COMMENTS:

23. **Table 6-3**. The table presents the selection of human health chemicals of potential concern. An asterisk is presented in the table in the "Detected Concentrations Range" column of the table. However, the endnotes on this table do not provide any information regarding the intended meaning of this notation. The endnotes should indicate the definition of the asterisk.

24. **Page 7-1, Section 7.0, Paragraph 1**. Six documents are described as current guidance for ERAs at Superfund sites. However, the Process Document (*Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessment*, 1997) supercedes the 1989, 1992, and 1996 guidance documents, and EPA has stated these older documents should not be used in the preparation of risk assessments. Region IV Supplemental Guidance has been superceded by the December 1998 memorandum; this memorandum may not have been available at the time this ERA was prepared. Since food chain modeling is not included in the Process Document, it will be necessary to cite some of the older documents in the text. In order to bridge the old and new guidance, the text should be revised so that it is clear that the older documents do not represent current guidance and stating why the superceded guidance documents are being used in this ERA.

25. **Page 7-5 through 7-7, Section 7.2.2; and Page 7-6, Figure 7-2**. The Conceptual Site Model (CSM) presented in the ERA is too general. Four broad groups of ecological receptors are identified–wildlife, terrestrial plants, terrestrial invertebrates, and aquatic receptors. As per guidance in the Process Document , the CSM should distinguish between exposure routes for different groups of wildlife receptors such as herbivorous birds and mammals, primary carnivores/omnivores, and secondary carnivores. A CSM should illustrate the food web and the relationship between the specific receptors that are being modeled. The CSM for Site 16 should be revised, or a second Figure illustrating the food web relationship between different receptors should be added to the ERA.

26. **Page 7-6, Figure 7-2**. The meaning of the bullets that appear in various receptor/exposure route boxes is not provided in either the figure or the text. It cannot be assumed that the reader will know that the bulleted boxes indicate complete exposure pathways. This

information should be added to the figure.

27. **Page 7-7, Section 7.2.2, Paragraph 1**. The text states that dermal adsorption is considered a negligible exposure pathway. This statement is generally qualified, since dermal adsorption can present a significant risk in areas that are heavily contaminated with particular compounds. The text should be modified to read that dermal adsorption is considered to be a negligible exposure pathway for receptors at this site relative to ingestion because the presence of fur and feathers is likely to prevent extensive direct contact with the skin. Also, the exclusion of the dermal adsorption and inhalation pathways from the ERA should be included as a source of uncertainty in the Uncertainty Analysis (Section 7.7).

28. **Page 7-7, Section 7.2.2, Paragraph 2**. The text states that no burrowing animals were observed as Site 16 during characterization. This does not mean that burrowing animals will not inhabit Site 16 in the future, since the area appears to be desirable to ecological receptors. The text should be modified to state that although no burrowing animals were seen at Site 16, the site does provide acceptable habitat for burrowing animals.

29. **Page 7-9 through 7-20, Section 7.3, Figure 7-3**. The selection process for ecological COCs has been changed in the Process Document. The most significant change is that the soil sampling data should first be screened against ecological screening levels. Only after screening are compounds present at concentrations greater than their ecological screening levels evaluated regarding frequency of detection, background levels, and role as essential nutrients. The selection process in this ERA for Site 13 should be revised to be in agreement with the new guidance.

30. **Page 7-11, Section 7.3, Paragraph 3, and Table 7-2**. The Dutch soil screening values from Beyer that were used as ecological screening values for Site 16 are out-of-date. Region IV has recently adopted soil screening values based on more recent screening values developed by the Netherlands, the Canadian Council of Ministers of the Environment, and Oak Ridge National Laboratory. The recommended screening value for arsenic is 10 mg/kg rather than 20 mg/kg and for chromium is 0.4 mg/kg rather than 100 mg/kg. Screening values for iron and silver have adopted. The ERA should acknowledge the new guidance and include some discussion as to whether the use of the newly adopted values would have altered the conclusions presented in the ERA.

31. **Page 7-13, Table 7-2**. The 95% UCL for aluminum is 11,271 mg/kg. This number is difficult to read since the first "1" is printed on the column line. The table should be revised so that the number is clearly printed.

32. **Page 7-20, Section 7.4.1, Paragraph 7**. The text states that a 10-fold attenuation factor was applied to the RME concentration of constituents in groundwater in order to derive an

exposure concentration for constituents in groundwater potentially reaching Clear Creek. No justification was provided in the ERA for the selection of 10 as the attenuation factor. The rationale for selecting this attenuation factor should be included in the ERA.

33. **Page 7-21, Section 7.4.2 and Page 7-25, Table 7-7**. The calculated risks to avian primary consumers are based solely on the Eastern Meadowlark, which consumes approximately 75% of its diet as invertebrates and 20% as plant materials. Because of differences in biouptake and bioaccumulation, the concentrations of contaminants in invertebrates and plants are generally disproportionate. The percentage of invertebrates and plants in the diet will alter the calculated risks to the receptor. This dietary difference is addressed for small mammals with the inclusion of both herbivorous and insectivorous primary consumers. In lieu of the inclusion of an herbivorous avian receptor, it is recommended that differences in diet be identified and discussed as a source of uncertainty in the ERA.

34. **Pages 7-35 through 7-39, Section 7.6.4**. Much of the discussion of risks from groundwater discharging to Clear Creek is inappropriate in the context of a risk assessment. Five compounds, bis(2-ethylhexyl)phthalate, 4,4'-DDT, aluminum, iron, and zinc are theoretically present in the groundwater at concentrations higher than screening criteria. It must therefore be assumed that there is a potential for risk. However, within the context of the risk assessment, these compounds are excluded as COCs for a variety of reasons, including frequency of detection, background concentrations, the presence of suspended solids in groundwater samples, and toxicity to resident species. These reasons are more properly part of the risk management process, and their discussion should be separate from the risk assessment. It is the responsibility of the risk manager and the trustees of the site working with the risk assessor to the significance of this information. The text should be revised so that the risk assessment and risk management discussions are separate and clearly identified.

35. **Page 7-36, Table 7-12**. A value of 50 ug/L is cited as the AQUIRE Lowest Reported Adverse Effect concentration. The value is for the narrow mouth frog. However, based on the AQUIRE values presented in Appendix I, the lowest reported adverse effect concentration is 15 ug/L for brown trout. The text (Page 7-38) correctly identifies 15 ug/L as the lowest value. The table entry should be corrected

36. **Page 7-38, Section 7.6.4, Paragraph**. The text states that aquatic receptors in Clear Creek downgradient of Site 16 are likely to be more tolerant of aluminum than larval trout. No evidence is presented to corroborate the validity of this statement. Additional discussion including the identification of species present in Clear Creek (or alternatively a reference to where the species list is located) and relevant toxicity data must be included to the text to support the statement that aluminum is less toxic to receptors in Clear Creek than indicated by the lowest AQUIRE value.

37. **Page 7-39, Section 7.7, Paragraph 6**. The text states that risks to amphibians and reptiles species from the surface soil were not estimated because bioaccumulation and toxicity data are lacking. Since quantitative exposure data are not available, a brief qualitative discussion as to whether risks to these groups are anticipated should be included in the Uncertainty

Analysis. The qualitative discussion might include information such as the general toxicity of the compounds present (i.e., are any known to be unusually toxic to these receptor groups in other media), their probable bioavailability, and whether the amphibian and reptile populations at this site show signs of stress.

38. **Page 7-41, Section 7.8, Paragraph 3**. The text states that risks to aquatic receptors in Clear Creek are not expected, based on the screening evaluation of groundwater. This is not correct; refer to Specific Comment 9. Five compounds, bis(2-ethylhexyl)phthalate, 4,4'-DDT, aluminum, iron, and zinc are theoretically present in the groundwater discharging into Clear Creek at concentrations higher than screening criteria. Their exclusion as COCs is based on a weight-of-evidence risk management discussion. In the ERA, these five compounds should be identified as having a potential to cause risk.

39. **Page 9-5, Section 9.1, Paragraph 3; and Page viii, Executive Summary, Paragraph 2**. The text states that risks were not identified for terrestrial wildlife resulting from exposure to compounds in surface soil or surface water, and that therefore reductions in the survivability, growth and reproduction of wildlife populations is not anticipated. This is incorrect. Sublethal risks associated primarily with cadmium, lead, and zinc in the surface soil were identified for small mammals, small birds, and predatory birds. Sublethal risks include reductions in growth and reproduction. This is correctly stated in Paragraph 7 on Page 9-5 and Paragraph 6 on Page viii. The text should be corrected.

40. **Page 9-5, Section 9.1, Paragraph 6; and Page viii, Executive Summary, Paragraph 5**. The text states that risks to aquatic receptors in Clear Creek are not expected, based on the screening evaluation of groundwater. This is not correct; refer to Specific Comment 9. Five compounds, bis(2-ethylhexyl)phthalate, 4,4'-DDT, aluminum, iron, and zinc are theoretically present in the groundwater discharging into Clear Creek at concentrations higher than screening criteria. The text should be corrected.

41. **Appendix H**. Spreadsheets showing the intermediate steps in the calculation of Potential Dietary Exposure (PDE) are not included. Data such as the calculated dietary exposure from each food item should be included.

42. **Appendix H, Table H-6**. For the Great-Horned Owl, a dietary exposure of 9% sediment is identified. This value causes the dietary percentages for the owl to total 108%. In Table 7-7 (Page 7-25), there is no mention of the ingestion of sediment by the owl, and the incidental ingestion of soil is reported to comprise 1% of the diet. There is no reference for the source of the sediment ingestion rate. The apparent discrepancy between Table H-6 and Table 7-7 should be resolved.